Appropriate Use of Medical Nutritional Supplements

[review]

Summary

Medical nutritional supplements are now commonly used in most hospitals and community care settings. In view of the increasing availability and variety of such supplements, healthcare professionals are faced with the issue of appropriate use of these formulas. This article will explore the different types of supplements available as well as the indications leading to choosing the right supplements. In addition, practical tips on the usage of medical nutritional supplements to encourage maximum compliance will also be dealt with.

Introduction

At the mention of nutrition supplements to a non-healthcare professional, one will instinctively associate it with commercial nutrition supplements. These commercial nutrition supplements include micronutrient concentrates such as vitamin C, calcium and multivitamin tablets, as well as evening primrose oil and gingko biloba among many others available in the pharmaceutical market today. Medical nutritional supplements or enteral nutrition formulas are very different in both contents and functions compared to these commercial nutrition supplements. It is with the intent of ensuring appropriate use of the medical nutritional supplements among adults that this article is presented.

Evolution of Medical Nutritional Supplements

Enteral nutrition has come a long way since its inception in ancient Eqypt, when practitioners used enemas of wine, milk, and grain broths to foster good health as well as to treat diarrhoea. It has evolved from the use of milk, eggs, sugar, broth and whiskey mixtures in 1700s and 1800s, to the development of the first casein hydrolysate in 1939[5], to the use of blenderised hospital diets strained through fine mesh, and foods processed through a serum mill to be liquefied, and finally to chemically defined commercial formulas in sterile, sealed containers during the late 1950s and 1960s.

What are Medical Nutritional Supplements?

Currently, medical nutritional supplements are referred to as nutritionally complete and balanced formulas which are prepared and stored in sterile conditions. The macronutrient composition of carbohydrates, proteins and fats are similar to that of a healthy diet consumed by a person. Most products are lactose free, and use casein hydrolysate as the protein source or soy protein for some. The carbohydrate used is usually in the form of maltodextrin, sucrose, glucose or corn syrup solids whereas the fat source is often a vegetable oil derivative. They supply vitamins, minerals and electrolytes and some contain added fibre in the form of soy polysaccharides or fructo-oligosaccharides.

Besides being nutritionally complete, many of the medical nutritional supplements come either in a ready-to-drink form in tetra-packs or cans, or in powdered form to be reconstituted. Some are milk-type (but lactose-free), while others are formulated like fruit beverages for those who are not keen on milk. Some are designed to meet higher energy needs or particular clinical indications.

Currently in Singapore, there are a wide variety of medical nutritional supplements available. Some of them are listed in Table 1* .

Indications for Medical Nutritional Supplements

Malnutrition is a common problem health professionals face in many hospitalised as well as community care patients. Some patients are at risk of developing poor nutritional balance due to their medical conditions and treatments. Patients with hypermetabolic demands, such as those with underlying chronic diseases or traumatic injuries, are particularly at risk. This effect can be accentuated with inadequate oral intake. Elderly patients are also especially vulnerable to being unable to maintain optimal nutritional balance often as a result of their poor oral intake due to common clinical factors such as poor dentition and dysphagia.

With increased nutritional requirements and/or reduced oral intake, some patients cannot maintain or achieve a good nutritional status because they are unable to eat adequate regular food to sustain themselves, even though they have a functioning gastrointestinal tract. Therefore the use of medical nutritional supplements can be a useful addition to the diet to achieve or improve nutritional balance[4,6] amongst these patients and may improve clinical outcomes[1,3]. Table 2 shows some of the common conditions that may necessitate nutritional support.

Types of Medical Nutritional Supplements for Adults

Formula Type	Nutritional Features	Patient Indications	Examples of Formula
Polymeric			
• Standard	1 kcal/ml, 40g protein/1000ml	All	Ensure Isocal Resource Standard
• High energy, high protein	1.5-2 kcal/ml, 60-80g protein/ 1000ml	Increased energy and protein requirements, fluid restrictions	Enercal Plus Ensure Plus Resource Plus
• Low protein, low electrolytes	20-30g protein/1000ml	Renal impairment, predialysis	Suplena
• High calorie, moderate protein, low electrolyte	2 kcal/ml, 70-75g protein/ 1000ml	Dialysis	Nepro Novasource Renal
• Fibre-enriched	14-15g fibre/1000ml	Normalise bowel habits, long term tube feeding	Fibersource Jevity
Elemental			
• Free amino acids or peptides as nitrogen source	25-45g protein/1000ml	Impaired digestion, malabsorption	Alitraq Vivonex T.E.N
Special Feeds			
• Disease specific	May contain one of the following: Branch chain amino acids, glutamine, arginine, fish oil, EPA, MCT oil, low carbohydrate content	Modified for specific disease states	- Falkamin, Hepatic Aid (hepatic failure) - Impact, Arginaid Extra (critical care, sepsis) - Pulmocare, Oxepa (impaired respiratory function) - Glucerna, Resource Diabetic (diabetes)
• Fruit based	1-1.2 kcal/ml, fat free	Alternative to milk- type supplements	Arginaid Extra Resource Fruit Beverage
Modular			
• Carbohydrate		Modular components of single nutrients may be useful to alter the caloric, protein or fat content of a base formula	Polycose
• Protein			ProMod, Propass
• Fat			MCT Oil

* The supplements listed are those commonly available at time of publication and is not fully extensive.

Table 1

Conditions that may Require Medical Nutritional Supplements

Nutritional Effects	Causes
• Oral intake is inadequate	• Poor appetite secondary to medical therapy e.g. radiation therapy, chemotherapy, medication • Medical conditions i.e. anorexia nervosa, depression, dementia, chronic renal disease, HIV/AIDS • Mechanical causes e.g. dysphagia due to stroke
• Nutritional requirements are increased	• Trauma, burns, major surgery • Sepsis, wound infections • HIV/AIDS, chronic obstructive pulmonary disease
• Inability to ingest food	• Carcinoma of the gastrointestinal tract (oesophagus, stomach) • Neurological problems, coma • Weaknesses due to chronic disease

Table 2

Use and Application of Medical Nutrition Supplements

There are two possible routes of administering the medical nutritional supplements. Depending on the patient's condition, the initial option may be to provide an oral medical nutritional supplement with or between regular meals. They can be sipped at intervals throughout the day, or if necessary as a meal replacement. However, if sufficient oral intake of food and supplemental formula is not possible, the second option is to administer the medical nutrition supplement through tube feeding either as a supplement to the oral diet or as a complete diet on its own.

Supplementation should only be considered when regular dietary measures alone have proved to be, or clearly will be, insufficient to sustain or improve oral intake and nutritional balance. Supplementation should always be regarded as an addition to normal food and not a substitute for it. They can also be used to enrich normal foods. They do not always have to be consumed as a drink. Patients should always be given guidance on both general dietary aspects and the use of supplements.

Choosing the right nutritional supplement will depend on the following:

- Degree of difficulty in meeting nutritional needs solely on diet intake
- Medical condition and specific nutritional requirements
- Presence or absence of dysphagia
- Taste preferences
- Susceptibility to taste fatigues
- Availability of resources for preparation of supplements
- Cost
- Intolerances to lactose or other ingredients in the supplements
- Gastrointestinal tolerance of the osmotic load of the supplements

It is important that the compliance with the supplement use is monitored to achieve the effectiveness of the nutrition therapy[2]. One of the challenges faced by dietitians, other healthcare professionals and caregivers is to ensure that patients sustain their interest and compliance with the supplements. Ideally patients should have the opportunity of sampling different products or flavours to determine their preference. There are also ways to improve the palatability and compliance of drinking these medical nutritional supplements.

Discuss with your dietitian on the appropriate use of medical nutritional supplements

Ways to improve the palatability of nutritional supplements:

- Powdered supplements can be incorporated into foods by directly adding into prepared foods or drinks such as juices, soups or sauces to increase the nutrient density.
- Liquid supplements can also be blended with double cream, milk or fruit juices, and ice into a refreshing beverage.
- They can be frozen and used as a form of ice-cream.
- Vanilla flavoured supplements can also be flavoured with common beverages, e.g. coffee, tea and malted drinks, i.e. milo, ovaltine, horlicks.

Creativity and experimentation may be necessary to discover more ways of increasing the variety in which the medical nutritional supplements can be served, and also the amount that can be added without impairing the texture and flavour of foods.

It is also important that recommended dosage levels are not exceeded to avoid creating new problems such as diarrhoea, or even renal problems in the elderly as a result of excessive protein loads. The patient's progress and use of supplements should be monitored regularly. As the patient's nutritional status improves or goals of treatment are reached, supplement intake can be gradually reduced and perhaps discontinued once the intake of regular meals is adequate.

Reading list

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Learning Points

- Medical nutritional supplements are nutritionally complete and balanced formulas for use among specific groups of patients to achieve nutritional balance.
- The choice of an appropriate formula will depend on the patient's medical condition and nutritional requirements.
- Monitoring the patient's compliance to the supplement use is important to ensure maximum benefit and effectiveness of the nutrition therapy.